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Supporting Information

Metallic Ion Leaching from Heterogeneous Catalysts: An Overlooked Effect in the Study of Catalytic Ozonation Processes

Submitted by

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This PDF file includes:

Table S1

Figure S1 to S7

Table S1. HPLC conditions for OA, nitrobenzene, *p*CBA measurements

Compound	**Wavelength (nm)**	**Mobile phase**	**Flow rate (mL/min)**	**Injection volume (μL)**
Oxalic acid	268	20mM KH_2PO_4/CH_3OH (97:3)	1	10
Nitrobenzene	254	DI/CH_3OH (50:50)	1	10
*p*CBA	234	20 mM H_3PO_4/CH_3OH (30:70)	1	10

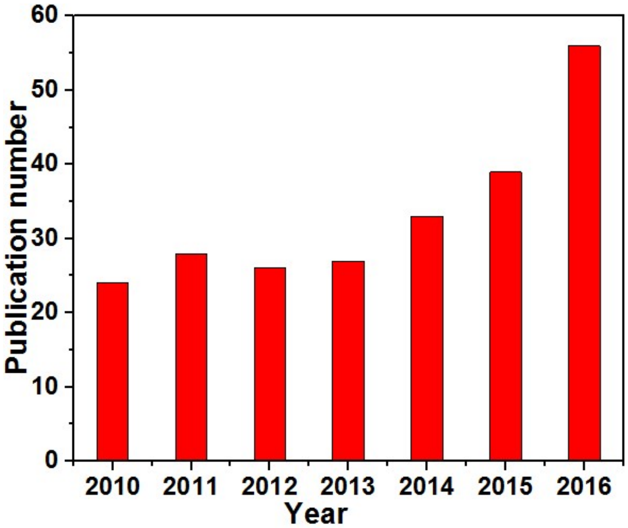

Figure S1. Number of research articles in the field of heterogeneous catalytic ozonation published from 2010 to 2016 according to Scopus (Elsevier).

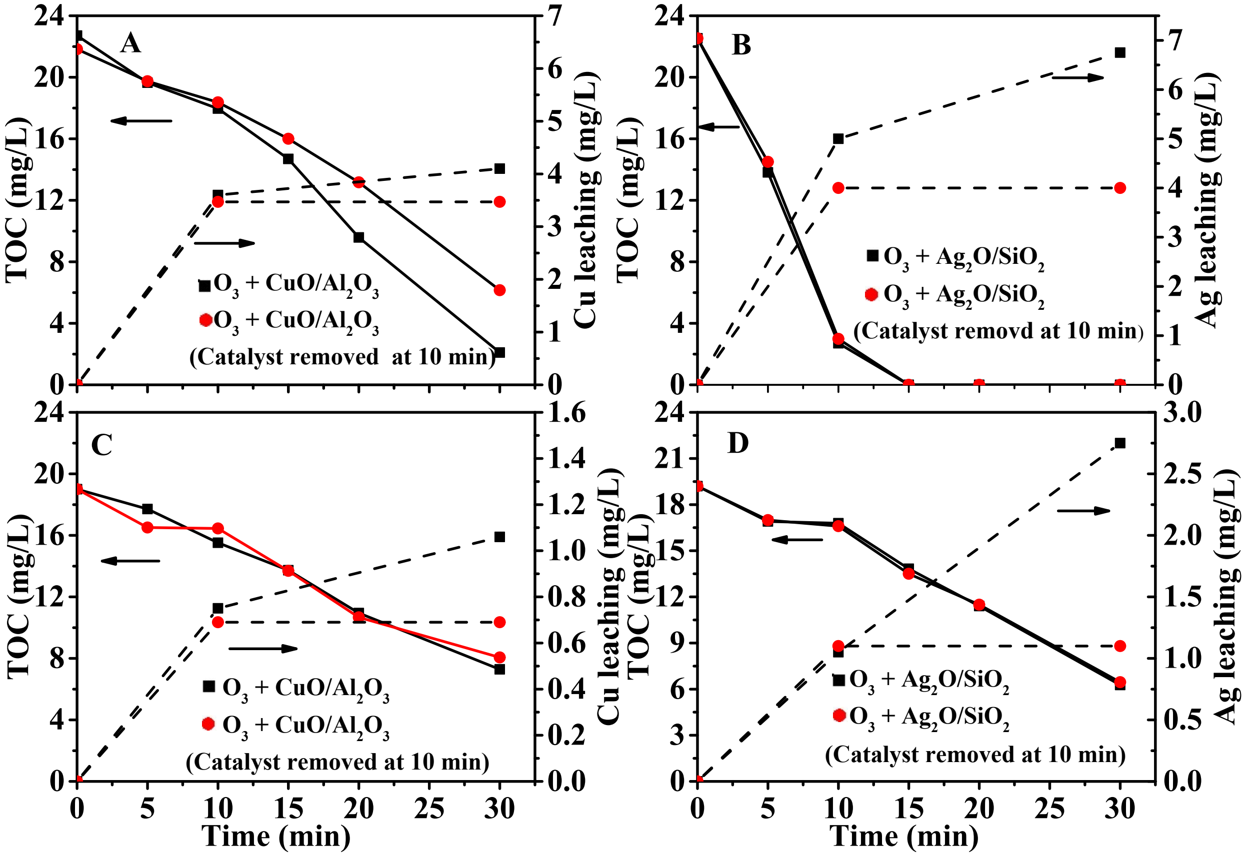

Figure S2. Mineralization of models compounds during catalytic ozonation: OA (A & B); and Nitrobenzene (C & D). [Initial OA: 1 mM; initial nitrobenezene: 0.325 mM; working solution: 200 mL; catalyst dose: 1 g].

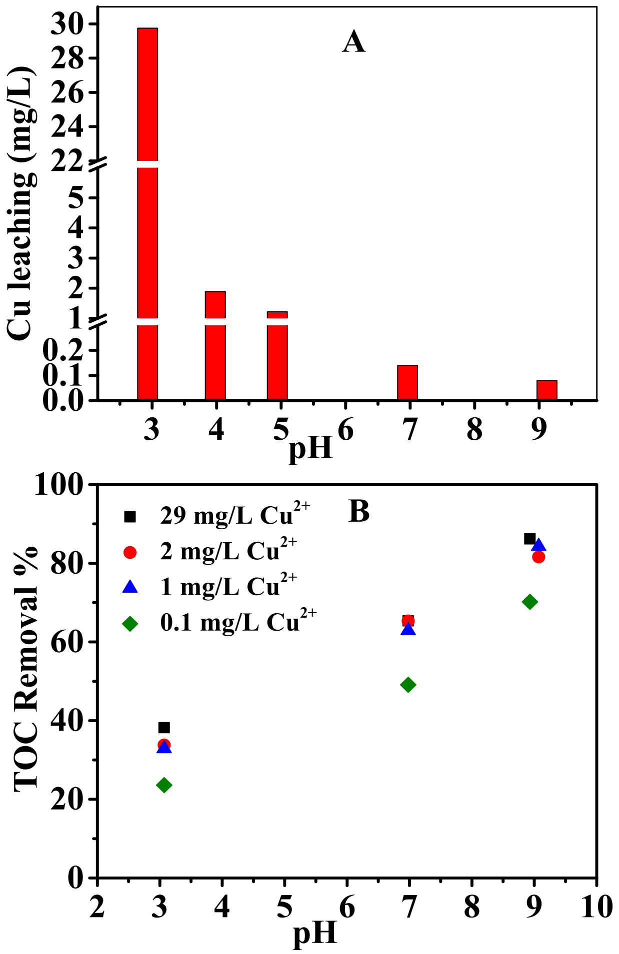

Figure S3. (A) Cu leaching in buffered nitrobenzene solutions at different pH [catalyst dose: 1 g CuO/SiO$_2$; nitrobenzene concentration: 0.325 mM; working solution: 200 mL; stirring time: 30 min]; (B) TOC reduction at different pH and copper ion concentrations. [Initial nitrobenzene concentration: 0.325 mM; working solution: 200 mL; reaction time: 30 min].

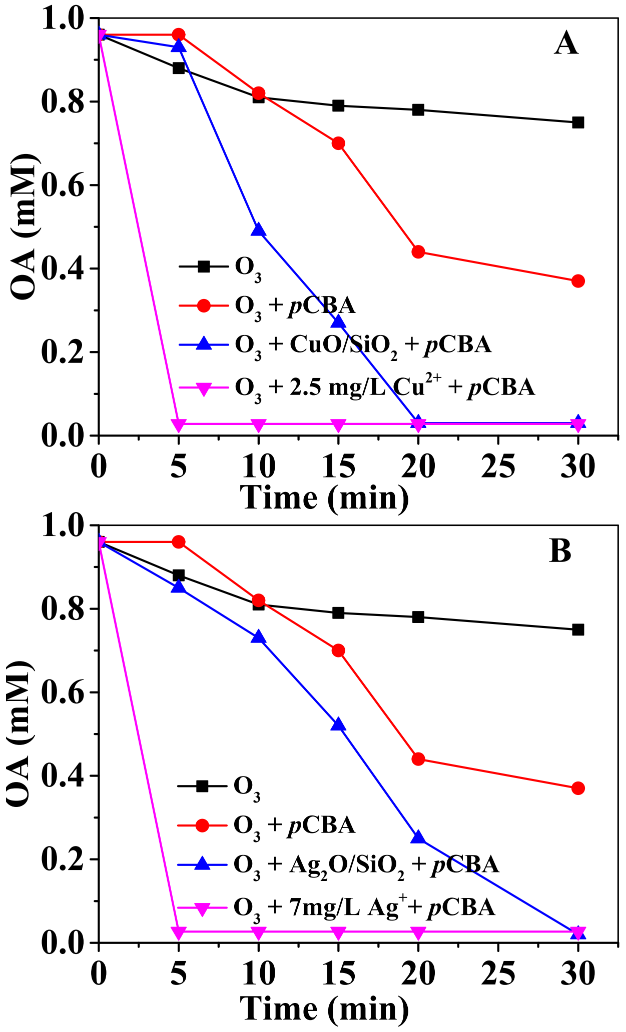

Figure S4. Effect of *p*CBA on the degradation of OA. [Initial OA: 1.0 mM; working solution: 200 mL; catalyst dose: 1 g; *p*CBA: 18 mg/L].

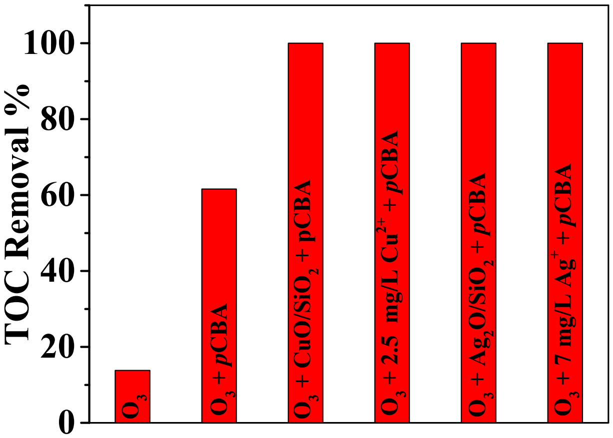

Figure S5. Comparison of TOC reduction with and without *p*CBA addition. [Initial OA: 1.0 mM; working solution: 200 mL; catalyst dose: 1 g; reaction time: 30 min; initial *p*CBA concentration: 18 mg/L].

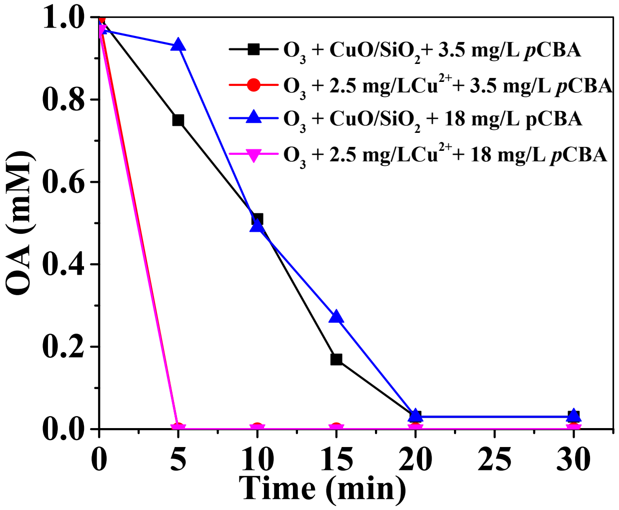

Figure S6. Effect of *p*CBA concentrations on the degradation of OA. [Initial OA: 1.0 mM; working solution: 200 mL; catalyst dose: 1 g].

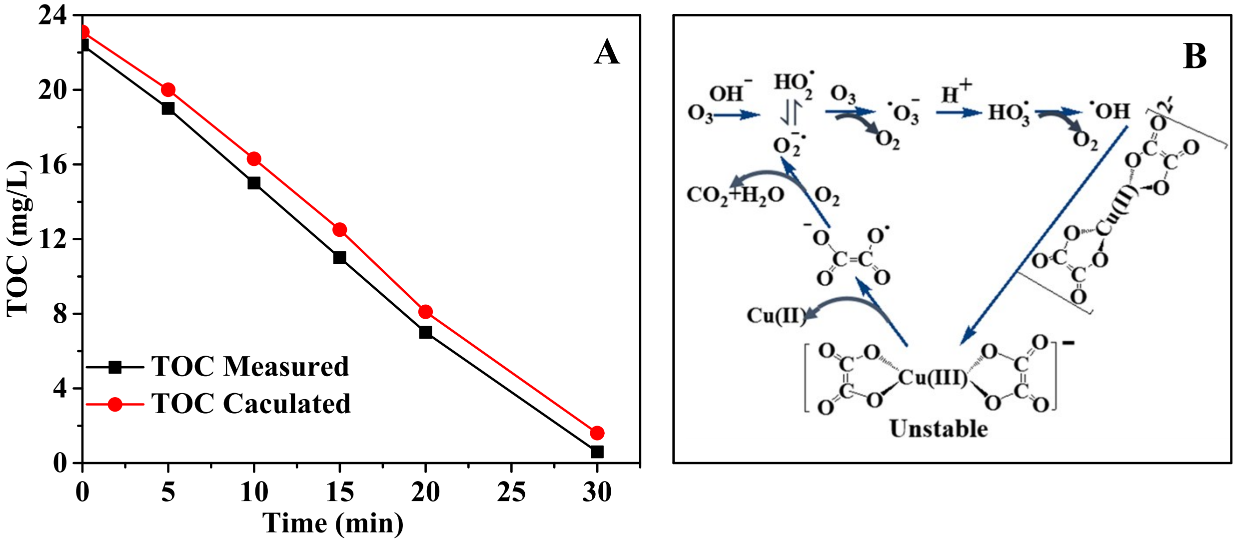

Figure S7. (A) Measured TOC vs. Calculated TOC based on OA concentration. [Initial OA: 1.0 mM; working solution: 200 mL; catalyst dose: 4.5 mg/L Cu^{2+}; pH = 6.59 ± 0.20]. (B) Proposed reaction mechanism of OA degradation during homogeneous catalytic ozonation with copper ion [Note: (1).Only representative Cu-oxalate complex is shown; and (2). Results shown in Figure S7A indicate the intermediate products are either unstable (e.g. radicals) or indistinguishable from oxalate (e.g. Cu-oxalate complex) using the current analytical method (HPLC-DAD)].